REMARKS

I. Introduction

In response to the Office Action dated September 21, 2006, which was made final, no claims have been cancelled, amended or added. Claims 1-26 remain in the application. Entry of these remarks and allowance of the application is requested.

II. Prior Art Rejections

A. The Office Action Rejections

On page (4) of the Office Action, claims 1-13, 15-22, 25 and 26 were rejected under 35 U.S.C. §103(a) as being unpatentable over Du, U.S. Patent No. 5,640,384 (Du), in view of Vaid et al., U.S. Patent No. 6,502,131 (Vaid), and further in view of Ater et al., U.S. Patent No. 6,687,224 (Ater). On page (8) of the Office Action, claims 14, 23 and 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Du in view of Vaid, further in view of Ater, and further in view of Ort, U.S. Patent 5,784,527 (Ort).

Applicant's attorney respectfully traverses these rejections.

B. The Applicant's Independent Claims

Applicant's independent claim 1 is directed to a method of optimizing data streaming in a peer-to-peer architecture including a plurality of clients in a chain, the method comprising:

each client monitoring its own bandwidth;

each client informing a succeeding client in the chain of that bandwidth;

each client comparing its own bandwidth with the bandwidth of a preceding client in the chain; and

each client, in response to a difference between the compared bandwidths, reordering its position among the clients in the chain.

Applicant's independent claim 16 is directed to a peer-to-peer data streaming system comprising a plurality of clients in a chain, each client including bandwidth-monitoring means for monitoring its own bandwidth, communication means for informing a succeeding client in the chain of that bandwidth, comparison means for comparing its own bandwidth with the bandwidth of a preceding client in the chain, and reconfiguration means responsive to a difference between the compared bandwidths to reorder its position among the clients in the chain.

Applicant's independent claim 25 is directed to a client terminal for use in a peer-to-peer data streaming system having a plurality of client terminals in a chain, the client terminal being configured or programmed to include bandwidth-monitoring means for monitoring its own bandwidth, communication means for informing a succeeding client terminal in the chain of that bandwidth, comparison means for comparing its own bandwidth with the bandwidth of a preceding client terminal in the chain, and reconfiguration means responsive to a difference between compared bandwidths to reorder its position among the client terminals in the chain.

Applicant's independent claim 26 is directed to a program storage medium readable by a computer having a memory, the medium tangibly embodying one or more programs of instructions executable by the computer to perform method steps for configuring or programming a client terminal for use in a peer-to-peer data streaming system having a plurality of client terminals in a chain, the method steps comprising the steps of:

configuring or programming the client terminal to monitor its own bandwidth;

configuring or programming the client terminal to inform a succeeding client terminal in the chain of that bandwidth;

configuring or programming the client terminal to compare its own bandwidth with the bandwidth of a preceding client terminal in the chain; and

configuring or programming the client terminal to reorder its position among the client terminals in the chain based upon a difference between compared bandwidths.

C. The Du Reference

Du describes a network comprising transceivers (1..6) linked in a network topology. The positions of the transceivers in the network topology are changed in dependence on the loads on the end-to-end connections (VC1..VC5) between the transceivers in the network. A configuration is chosen to give efficient use of the capacity available in the network. Each time that a new end-to-end connection (VC) within the network is set up the positions of the transceivers (1..6) are changed such that the network remains optimized.

D. The Vaid Reference

Vaid describes a method and system (100) for monitoring or profiling quality of service within one or more information sources in a network of computers. The method includes a step of providing a network of computers, each being coupled to each other to form a local area network.

The network of computers has a firewall server (110) coupled to the network of computers and a distributed traffic management tool coupled to the firewall server. The method also includes implementing traffic monitoring or profiling of incoming and outgoing information from one of the information sources.

E. The Ater Reference

Ater describes a bandwidth sharing method for use on respective interstitial connections between on one side a plurality of users and on the other side a common data-link having a shared packet switching device, the method including performing the steps of: monitoring data-link directed bandwidth from each user; maintaining a current sum of the monitored bandwidth; and whenever the current sum exceeds a predetermined data-link bandwidth threshold, reducing current collective data-link directed bandwidth by for substantially each user, comparing the respective user's data-link directed bandwidth with a predetermined data-link bandwidth threshold for the respective user; using an allocation function, selecting at least one user who is exceeding his predetermined data-link bandwidth threshold, and for a predetermined time interval, cutting the connection between each selected at least one user and the shared switching device, so as to restore a current sum of the monitored bandwidth to be not greater than the predetermined data-link bandwidth threshold.

F. The Applicant's Claims Are Patentable Over The References

Applicant's invention, as recited in independent claims 1, 16, 25 and 26, is patentable over the references, because the claims recite limitations not found in the references.

Nonetheless, the Office Action asserts the following:

> Response to Arguments
>
> Claims 1-26 are pending in this application.
>
> Applicant's arguments filed June 30, 2006 have been fully considered but they are not persuasive.
>
> In response filed, applicant argues in substance that:
>
> a. The combination of Du, Vaid and Ater does not teach or suggest each client monitoring each its own bandwidth, each client informing a succeeding client in the chain of that bandwidth, each client comparing its own bandwidth with the bandwidth of a preceding client in the chain, and each client, in response to a difference between the compared bandwidth, reordering its position among the clients in the chain (remarks, page 15).
>
> In response to argument [a], Examiner disagrees in light of following:

Claim 1 stands rejected as follows:

As per claim 1, Du teaches the method comprising (Abstract): each client informing a succeeding client in the chain of that bandwidth (Figs. 2a-2c; each transceiver is informed of other transceiver's bandwidth); and each client, in response to a difference between the compared bandwidths, reordering its position among the clients in the chain (Abstract, col. 4, lines 9-55).

Du however does not explicitly teach a client monitors its own bandwidth.

Vaid teaches that a client monitors its own bandwidth (col. 3, lines 8-24, Figs. 9-11).

Therefore it would have been obvious to one ordinary skill in the art at the time of the invention to modify the teachings of Du to explicitly teach a client that monitors it's own bandwidth as taught by Vaid in order to measure quality of service in transferring data over the internet (Vaid, col. 2, lines 12-22).

One ordinary skill in the art would have been motivated to combine the teachings of Du and Vaid to provide a method to monitor the flow of information among a network of clients (Vaid, col. 2, lines 56-67).

Du in view of Vaid does not explicitly teach comparing bandwidth between two users and a method of optimizing data streaming in a peer-to-peer architecture including a plurality of clients in a chain.

Ater teaches a method of optimizing data streaming in a peer-to-peer architecture including a plurality of clients in a chain and further teaches that in the peer to peer sharing, the peer monitors the bandwidth of another peer (Figs. 1-12, Abstract, col. 4, lines 10-67).

Therefore it would have been obvious to one ordinary skill in the art at the time of the invention to modify the teachings of Du in view of Vaid to instead monitor and compare the bandwidth of the user in a peer to peer architecture as taught by Ater in order to control the bandwidth of users in a peer to peer network (Ater, col. 4, lines 50-67).

One ordinary skill in the art would have been motivated to combine the teachings of Du, Vaid and Ater in order to provide a system to control the bandwidth of users in a peer to peer network (Ater, col. 4, lines 50-67).

Du, in particular teaches the reordering the position of each transceivers according to their bandwidth (see fig. 2a-2c). Du does not teach the process wherein the devices monitor their own bandwidth.

Vaid, discloses a system that is able to monitor the clients own bandwidth (col. 3, lines 8-24, Figs. 9-11). When Du is modified in view of Vaid, i.e. when the monitoring process of Vaid is implemented in Du, Du's devices will be able to monitor their own bandwidth.

Furthermore, when the combination of Du and Vaid is modified in view of Ater, the devices would be able to monitor their own bandwidth, compare their bandwidth with other devices, and reorder their position in a hierarchy.

Therefore, the combination of Du, Vaid and Ater does teach and disclose the limitations as claimed in independent claims.

As such, the rejection is maintained.

Applicant's attorney disagrees with the above analysis.

The combination of Du, Vaid and Ater does not teach or suggest each client monitoring its own bandwidth, each client informing a succeeding client in the chain of that bandwidth, each client comparing its own bandwidth with the bandwidth of a preceding client in the chain, and each client, in response to a difference between the compared bandwidths, reordering its position among the clients in the chain.

1. *Du does not teach or suggest "each client informing a succeeding client in the chain of that bandwidth, and each client, in response to a difference between the compared bandwidths, reordering its position among the clients in the chain."*

The Office Action asserts that Du teaches each client informing a succeeding client in the chain of that bandwidth, and each client, in response to a difference between the compared bandwidths, reordering its position among the clients in the chain.

The cited portions of Du are set forth below:

> Du: Abstract
>
> The application describes a network comprising transceivers (1..6) linked in a network topology. The positions of the transceivers in the network topology are changed in dependence on the loads on the end-to-end connections (VC1..VC5) between the transceivers in the network. A configuration is chosen to give efficient use of the capacity available in the network. Each time that a new end-to-end connection (VC) within the network is set up the positions of the transceivers (1..6) are changed such that the network remains optimized.

Du: Figs. 1 and 5

U.S. Patent Jun. 17, 1997 Sheet 1 of 8 5,640,384

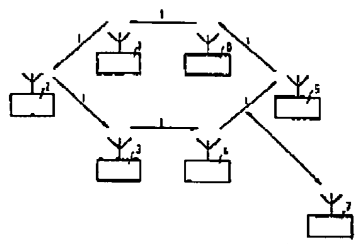


FIG.1

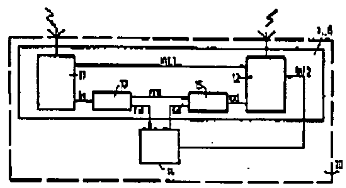


FIG.5

Du: Figs. 2a-2c

U.S. Patent Jun. 17, 1997 Sheet 2 of 8 5,640,384

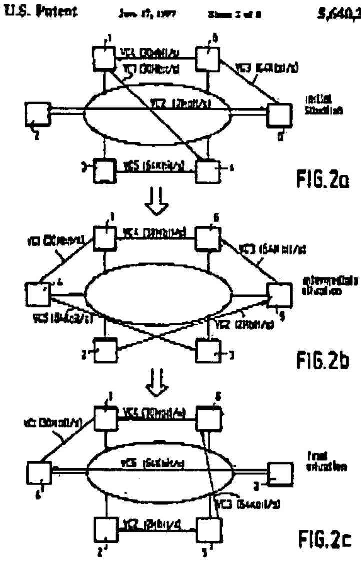


FIG.2a

FIG.2b

FIG.2c

Du: col. 4, lines 9-55

The radio frequency manager 7 every time that a connection is set up or ended, receives this information via the radio signalling channel from the transceivers. When a new connection is set up the radio frequency manager 7 gets

the expected mean load of this connection from the transceiver. Only in these situations the radio frequency manager 7 has to change positions of the transceivers. The radio frequency manager 7 can for example calculate the sum S for every configuration of all the transceivers in the ring. It then chooses the configuration which results in the highest value of S. Especially when the ring has a lot of transceivers and when a lot of virtual channels exist these calculations can take a considerable amount of time. Then a faster optimization procedure could be followed. The radio frequency manager 7 then starts to optimize the network as follows: The transceivers of the virtual channel with the highest mean loads and the lowest frequency utilization factors are placed next to each other. The sum S is calculated for this configuration. When S is larger than in the previous situation, improvement is achieved. Then for the transceivers with the next largest mean load the process is repeated. This will continue until no improvement can be made any more.

This procedure is now further explained: In the initial situation of FIG. 2a the virtual channel with the highest mean load and the lowest frequency utilization factor is VC1. This means that transceivers 1 and 4 should become neighbours. Transceiver 1 is maintained on its position, because VC4 with also a high mean load has a frequency factor of 1, so transceiver 6 and 1 should remain neighbours. So, transceiver 4 is placed next to transceiver 1 while the mutual positions of the other transceivers remain unchanged. This situation is shown in FIG. 2b. The value of S is improved. Now it has to be determined if further improvement is possible. Therefore transceiver 2 and 5 belonging to VC2 are brought closer together. The result is shown in FIG. 2c. The sum S is further improved. In the configuration of FIG. 2c no further improvement can be reached. Putting the transceivers belonging to VC3 or VC5 close together would have as a result that the frequency factor of VC1 and VC4 is decreased. Since those two virtual channels have a much higher mean load this would lead to a deterioration of the efficiency of the whole network. The sum S would decrease. The fast optimization procedure described here is only one of the possibilities to optimize the network configuration. In case of lack of time to calculate the optimal configuration, also a configuration can be used in which the capacity of the network is used efficiently already, although it is not the best configuration. For example the situation of FIG. 2b is already very satisfactory and could under theses circumstances very well be used.

The Office Action misinterprets Du when it asserts that it teaches that each client informing a succeeding client in the chain of that bandwidth, and each client, in response to a difference between the compared bandwidths, reordering its position among the clients in the chain.

Instead, Du merely describes how a centralized device, the radio frequency manager 7, configures the positions of the transceivers 1-6, every time that a connection is set up or ended. In Du, when a new connection is set up, the radio frequency manager 7 gets the expected mean load of this connection from the transceiver 1-6 and then may change the positions of the transceivers 1-6.

2. *Vaid does not teach or suggest "a client monitors its own bandwidth," in the context where each client informs a succeeding client in the chain of that bandwidth, and each client, in response to a difference between the compared bandwidths, reorders its position among the clients in the chain.*

The Office Action admits that Du does not teach a client monitoring its own bandwidth. However, the Office Action asserts that Vaid teaches that a client monitors its own bandwidth.

The cited portions of Vaid are set forth below:

Vaid: col. 3, lines 8-24

In an alternative specific embodiment, the present invention provides a novel computer network system having a real-time bandwidth profiling tool. The real-time bandwidth profiling tool has a graphical user interface on a monitor or display. The graphical user interface includes at least a first portion and a second portion. The first portion displays a graphical chart representing the flow of information from at least one information source. The second portion displays text information describing the flow of information. The combination of the first portion and the second portion describes the information being profiled. Additionally, the graphical user interface has a portion that outputs a graphical representation including text or illustration of the source itself. The flow of information can be from a variety of sources, such as those described above as well as others, to provide a distributed profiling tool.

Vaid: Figs. 9-11

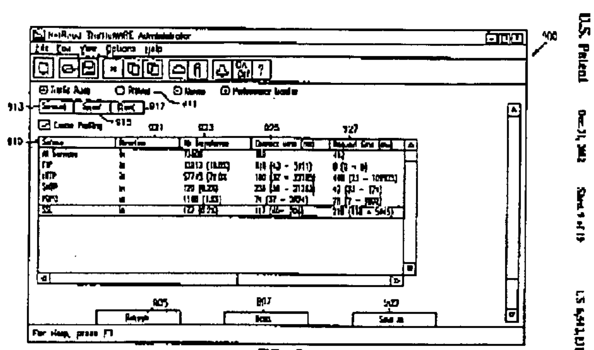


FIG. 9

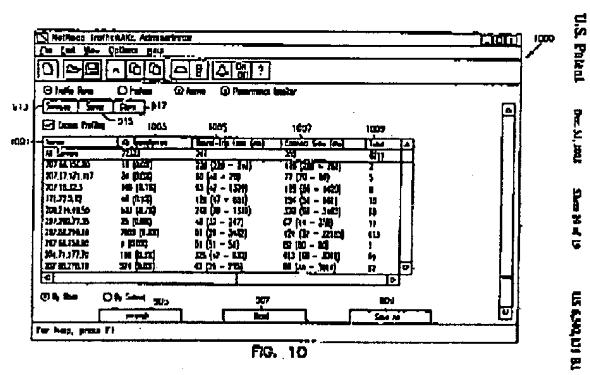


FIG. 10

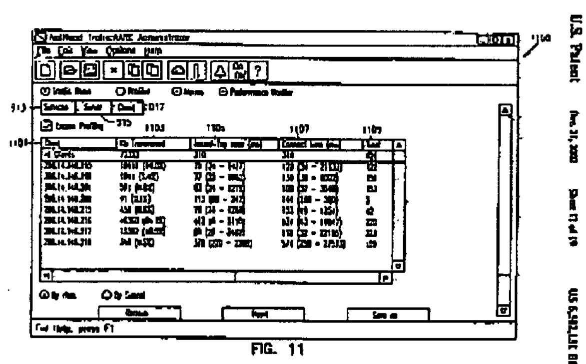


FIG. 11

Vaid: col. 2, lines 12-22

Quality of Service is often measured by responsiveness, including the amount of time spent waiting for images, texts, and other data to be transferred, and by throughput of data across the Internet, and the like. Other aspects may be application specific, for example, jitter, quality of playback, quality of data transferred across the Internet, and the like. Three main sources of data latency include: the lack

of bandwidth at the user (or receiving) end, the general congestion of Internet, and the lack of bandwidth at the source (or sending) end.

Vaid: col. 2, lines 56-67 (actually, col. 2, line 56 – col. 3, line 7)

In a specific embodiment, the present invention provides a system with a novel graphical user interface for monitoring a flow of information coupled to a network of computers. The flow of information can come from a variety of location or nodes such as a firewall, a server, a wide area network, a local area network, a client, and other information sources. The user interface is provided on a display. The display has at least a first portion and a second portion, where the first portion displays a graphical chart representing the flow of information, which comes from one of many locations on the network. The second portion displays text information describing aspects of the flow of information. The combination of the first portion and the second portion describes the information being profiled. The display also has prompts in graphical or text form or outputs the source of the flow of information, where the source can be one of a plurality of nodes such as a server, a firewall, a wide area network, a local area network, a client, and other information sources. The present invention can be distributed over a network by way of one or more agents.

The Office Action misinterprets Vaid when it asserts that it teaches that a client monitors its own bandwidth, because it does not perform such a function in the context where each client informs a succeeding client in the chain of that bandwidth, and each client, in response to a difference between the compared bandwidths, reorders its position among the clients in the chain.

Instead, Vaid merely describes a real-time bandwidth profiling tool for a computer. The real-time bandwidth profiling tool of Vaid has a graphical user interface for monitoring the flow of information coupled to a network of computers. However, nothing in Vaid suggests that this information is shared with other devices (or that 'succeeding clients' even exist), or that the information is used in the context of reordering the position of clients in a chain.

3. *Ater does not teach or suggest "a method of optimizing data streaming in a peer-to-peer architecture including a plurality of clients in a chain and further teaches that in the peer to peer sharing, the peer monitors the bandwidth of another peer."*

The Office Action admits that Du and Vaid does not teach comparing bandwidth between two users and a method of optimizing data streaming in a peer-to-peer architecture including a plurality of clients in a chain.

However, the Office Action asserts that Ater teaches the monitoring and comparing the bandwidth of the user in a peer-to-peer architecture in order to control the bandwidth of users in a peer to peer network.

The cited portions of Vaid are set forth below:

Ater: Abstract

A bandwidth sharing method for use on respective interstitial connections between on one side a plurality of users and on the other side a common data-link having a shared packet switching device, the method including performing the steps of:

monitoring data-link directed bandwidth from each user;

maintaining a current sum of the monitored bandwidth; and

whenever the current sum exceeds a predetermined data-link bandwidth threshold, reducing current collective data-link directed bandwidth by

for substantially each user, comparing the respective user's data-link directed bandwidth with a predetermined data-link bandwidth threshold for the respective user;

using an allocation function, selecting at least one user who is exceeding his predetermined data-link bandwidth threshold, and

for a predetermined time interval, cutting the connection between each selected at least one user and the shared switching device, so as to restore a current sum of the monitored bandwidth to be not greater than the predetermined data-link bandwidth threshold.

Ater: col. 4, lines 10-67 (actually, col. 4, line 10 – col. 5, line 7)

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to a bandwidth sharing method (illustrated in FIG. 1) for use on respective interstitial connections 12 between on one side a plurality of users 34 and on the other side a common data-link 5 (to a data-communications topology 7 using at least one compatible protocol; e.g. the Internet, LAN, WAN, intra-net, etc.) having a shared packet switching device 6. The instant method 10 includes performing the steps of:

monitoring 11 data-link directed bandwidth from each user (According to one embodiment the monitoring is of all the bandwidth used by each user, even the bandwidth which is directed to another user via the shared packet switching device; and not intended to use any bandwidth on the common data-link. According to another embodiment the monitoring is only of the data-link directed bandwidth used by each user. Monitoring with a differentiation between destinations requires a much higher degree of data examination and recognition than monitoring of all bandwidth.);

maintaining 12 a current sum of the monitored bandwidth; and

whenever the current sum exceeds a predetermined data-link bandwidth threshold, reducing 13 current collective data-link directed bandwidth by

for substantially each user, comparing 14 the respective user's data-link directed bandwidth with a predetermined data-link bandwidth threshold for the respective user;

using an allocation function, selecting 15 at least one user who is exceeding his predetermined data-link bandwidth threshold, and

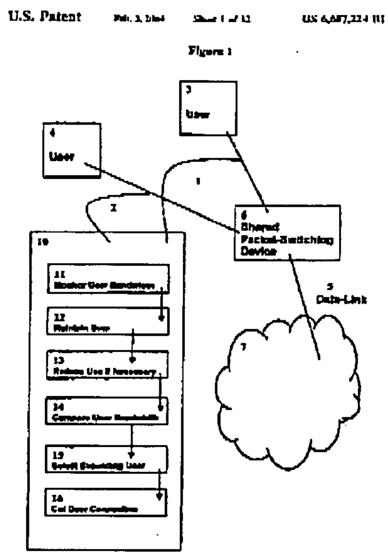
for a predetermined time interval, cutting 16 the connection between each selected at least one user and the shared switching device, so as to restore a current sum of the monitored bandwidth to be not greater than the predetermined data-link bandwidth threshold.

According to the preferred embodiment of the present invention, performing at least one of the steps is done above a predetermined frequency. For example, the step of monitoring is done by sampling each respective user with the common packet switching device every 10 milliseconds, or the step of maintaining is done (updated) every 10 milliseconds, or the step of reducing is done every 5 milliseconds, etc.

According to an embodiment of the present invention, the sub-steps of comparing and selecting are performed substantially with the same frequency as the monitoring step, so that the prerequisites to the sub-step cutting are always available in a updated form. Since all of the steps and sub-steps of the instant method may be performed asynchronously, it is preferred that the legitimacy of performing any cutting be maximized; and that occurrences where the cutting is (after the fact) irrelevant to preventing exceeding common data-link bandwidth allotment are minimized. (Substantially equivalent embodiments of the method of the present invention may be installed directly in an external computer-like device such as 10, or functions accomplished by the steps of the present method may be divided between cooperating front ends of 3 and 4 with back ends of 6 and 7, or a combination of external computer-like device with front ends or with back ends, or the total combination of all.)

However, consider also the following portions of Ater:

Ater: Fig. 1



Ater: col. 7, lines 15-28
Bandwidth Control Machine
Introduction

A step by step description for an algorithm for Bandwidth Control (BC) is presented. In the context of a plurality of users, the general purpose of the BC algorithm is for limiting Bandwidth (BW) usage, or conversely guaranteeing a minimum BW. More specifically, the purpose of the BC algorithm is to be able to guarantee a minimal bandwidth to customers who will purchase such an advantage, and to equally distribute the momentarily unused bandwidth to all users.

Ater: col. 7, lines 60-67
General Approach

The BC machine described here functions to some extent in a similar manner to an elementary Math problem: 24 pipes bring water into a pool at the rate of 10 gallons per second, while one pipe takes water out of the pool at a rate of 100 gallons per second. The pool can contain 140,000 gallons. How long will it take to fill the pool?

Ater: col. 8, lines 16-39

In the case of the BC-type machine, the pool is the switch buffer, the pipes are the ports attached to the users, and the pipe taking the information out is the up-link.

The complete implementation is based on additional requirements:

1. The BC machine is independent of the switch it is associated with.
2. The flow into the switch buffer is not constant. The average flow is determined by sampling the data flow at constant time intervals.

3. The flow out of the switch buffer is constant.

4. The parameters shall be sufficiently flexible to accommodate up-links from 1.55 MBit/Sec up to 155.52 MBit/Sec.

5. A similar machine shall be designed for the information flow from the up-link to the users. However that machine shall be required to limit the flow, since there is no buffer to overflow.

The proposed machine assumes that there is no information from the switch, regarding the buffer, or flow rate of the data. If the switch can provide indication of its buffer filling, then the machine will function the same; and we can drop the integrative function of the variable B defined below.

Ater merely describes an algorithm for Bandwidth Control (BC) that is used in conjunction with a single switch buffer, wherein the switch buffer has multiple ports attached to the users for the flow of data into the switch and an up-link for the flow of data out of the switch. The general purpose of the Bandwidth Control algorithm is for limiting bandwidth (BW) usage, or conversely guaranteeing a minimum bandwidth. The specific purpose of the Bandwidth Control algorithm is to be able to guarantee a minimal bandwidth to customers who will purchase such an advantage, and to equally distribute the momentarily unused bandwidth to all users.

However, contrary to the assertions in the Office Action, only the Bandwidth Control device of Ater monitors the bandwidth of each user; each user does not monitor its own bandwidth. In addition, only the Bandwidth Control device of Ater is informed of each user's bandwidth; none of the users inform a succeeding user in the chain of its bandwidth (indeed, there are no "succeeding" users or a "chain" of users in Ater). Moreover, it is only the Bandwidth Control device of Ater that compares the bandwidths of the various users; each user does not compare the bandwidths of other users. Finally, none of the users in Ater have their "position" reordered; instead, the Bandwidth Control device of Ater reduces the bandwidth of the user or cuts the connection of the user.

4. *The combination of references does not teach or suggest Applicant's claims.*

Consequently, the combination of Du, Vaid and Ater does not teach or suggest all the limitations of Applicant's independent claims. Indeed, not only does the Office Action fail to set forth a prima facie case of obviousness, the Office Action relies on hindsight to maintain that the references can be combined or modified in the manner suggested. Certainly, there is nothing in the references themselves that suggest the particular combination, or that suggest the references can be modified in such a manner as to render Applicant's claims obvious.

Moreover, Ort fails to overcome the deficiencies of the combination of Du, Vaid and Ater. Recall that Ort was cited only against dependent claims 14, 23 and 24, and merely for teaching the handling of errors encountered in an MPEG audio/video data stream during playback.

Thus, Applicant's attorney submits that independent claims 1, 16, 25 and 26 are allowable over Du, Vaid, Ater and Ort. Further, dependent claims 2-15 and 17-24 are submitted to be allowable over Du, Vaid, Ater and Ort in the same manner, because they are dependent on independent claims 1, 16, 25 and 26, respectively, and thus contain all the limitations of the independent claims. In addition, dependent claims 2-15 and 17-24 recite additional novel elements not shown by Du, Vaid, Ater and Ort.

III. Conclusion

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited.

Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicant's undersigned attorney.

Respectfully submitted,

GATES & COOPER LLP
Attorneys for Applicant

Howard Hughes Center
6701 Center Drive West, Suite 1050
Los Angeles, California 90045
(310) 641-8797

Date: November 21, 2006

By: ____________________
Name: George H. Gates
Reg. No.: 33, 500

GHG/

G&C 160. 30-US-01